

Session 3 Overview

Particulate Cleanup Fundamentals

Session Chairs

Gerhard Kasper
University of Karlsruhe
Germany

Vann Bush
Southern Research Institute
USA

This session contains 15 papers which broadly fall into three aspects of particulate cleanup: ash or char properties, filtration experiments and modeling, pulse cleaning or filter regeneration studies.

The authors come from China, Korea, Japan, Germany, and the United States. They represent academia, research institutes, and industry, with a preponderance of papers from academia, as would be expected in a session dealing with fundamentals.

The topic of ash and char properties includes characterization of particulate size, concentration and composition in cake as well as gas, the fundamentals of material transformations in filter cakes as affected by particle properties, modifications to filter cake properties, and the use of char permeability measurements to size filter systems.

Papers on the subject of filter regeneration include experimental studies from room temperature to 1500 °F. Numerical models have been developed to describe the effects of pulse cleaning on cake release, including the phenomenon and effects of 'patchy cleaning'. Some modeling work is reported that describes flow and particle deposition in filter vessels, as are experimental apparatus to simulate hot gas filtration.

Effective cleaning of the filters has become a more evident priority as experience accumulates with hot gas cleanup systems. We are pleased that this session focuses on this priority. Two related aspects of particulate cleanup dominate the papers in this session: the cleaning effectiveness and filter cake cohesiveness. Tools are described that are intended to improve the design of pulse cleaning systems, to increase the efficiency of cleaning, and to elucidate the effect of cleaning systems on filter pressure drop. In most of these tools the properties of the filter cake are explicitly included. We expect this session to increase our understanding of this important relationship, and thereby lead to improved filter design and operation.